The Influence of Perceived Risk to Health and Immigration-Related Characteristics on Substance Use Among Latino and Other Immigrants

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Objectives. We examined whether immigration-related characteristics and perceptions of risk surrounding substance use were independently associated with lifetime use of cigarettes and various illicit substances among immigrant and native-born Latino and non-Latino White adults in the United States.

Methods. Data were from the 2002 National Survey on Drug Use and Health. Analyses were limited to Latinos and non-Latino Whites 18 years and older. We used cross-tabulations and multivariate logistic regression to test relations between risk perceptions, immigration characteristics, and substance use.

Results. More than two thirds of all respondents perceived moderate or great risk to health and well-being associated with all substances analyzed. The odds of lifetime substance use by Latino and non-Latino White immigrants were lower than for US-born non-Latino Whites. Immigrant Latinos' odds of lifetime substance use were lower than for US-born Latinos. Moderate or great perceived risk was associated with lower likelihood of lifetime use of all substances except cigarettes.

Conclusions. Foreign birth appeared to protect against substance use among both Latino and non-Latino White immigrants. Future studies should examine potential protective factors, including cultural beliefs and practices, acculturation, familial ties, and social network influences. (*Am J Public Health.* 2008;98: 862–868. doi:10.2105/AJPH.2006.108142)

The significant health, social, and economic burdens of substance use and abuse[1] demand greater understanding of the interplay between risk and protective factors, including race/ethnicity and nativity. Latinos appear to engage in health-promoting substance use behaviors over their lifecourse.[2–5] Data from the National Survey on Drug Use and Health (NSDUH) indicate that past-month and past-year rates of illicit substance use are similar for Latinos and non-Latino White adults, yet estimates of lifetime illicit substance use differ (37.2% vs 48.1%, respectively).[4] The mechanisms underlying differences in substance use have not been fully elucidated. Psychosocial factors such as social norms, peer and family attitudes toward and behaviors regarding substance use, family bonding, individual academic accomplishments, and substance use at a young age (i.e., preadolescence or adolescence) may influence lifetime attitudes and behaviors regarding substance use.[6–8] Using nationally representative data, we examined the roles of perceived risk to health (of substance use) and immigration characteristics as correlates of substance use among immigrant and US-born Latinos and non-Latino Whites.

Demographic shifts and variations in substance use may create a need for detailed investigations of Latinos' and immigrants' substance use behaviors. Latinos are the largest racial/ethnic subgroup in the United States. By 2005, more than 41.9 million Latinos resided throughout the country, and of these, 40% were foreign-born.[9] If current trends continue, by 2045, 23% of all US residents (approximately 90.3 million people) will be of Latino ancestry.[10] Attending to the health and health care needs of Latinos and immigrants is a vital investment in the nation's future health.

Heterogeneity among Latinos and non-Latino Whites underscores the need for disaggregating data by birthplace.[3,11,12] The National Epidemiological Survey on Alcohol and Related Conditions showed that US-born Whites were more likely to meet criteria for a *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (*DSM-IV*),[13] substance use disorder than were native and immigrant Mexican American adults; yet, even US-born Mexicans were more likely than were Mexican immigrants to be diagnosed with any substance use disorder.[3] Cross-cultural studies found that substance use varies among immigrants between and within birth countries.[12,14,15] In Mexico, which historically has sent large numbers of immigrants to the United States,[11] the prevalence of lifetime substance use is less than that of industrialized countries (the United States, Canada, the Netherlands, Brazil, and Germany)[12]; yet, substance use varies geographically within the country. Rates of illicit substance use are highest in Tijuana (14.7%) and Ciudad Juarez (9.2%), cities on the US–Mexico border where injection of heroin, methamphetamine, and cocaine is particularly prevalent.[16] Substance use prevalence also varies by birthplace (i.e., mainland vs island) and immigration experiences among Puerto Ricans.[17]

Non-Latino White immigrants are heterogeneous, including both Western (e.g., United Kingdom) and Eastern Europeans (e.g., Poland, Russia).[11] One US study reported higher lifetime odds of any substance use disorder among US-born non-Latino Whites compared with White immigrants[3]; data were not disaggregated by country of origin. Yearly and lifetime rates of use of certain substances (cocaine, marijuana) may be lower in some European countries[14,15] compared with rates in the United States.

Frameworks explaining differences in illicit substance use by country of nativity have considered psychosocial factors such as acculturation[18] and social environment (e.g., family health behaviors and family cohesion, age at initiation).[6] Gil and Vega's framework of immigrant adolescent substance use[18] proposes the migration context as one of several

factors shaping substance use behaviors, reflecting a family's premigration socioeconomic and cultural circumstances as well as age at immigration. This framework also includes immigration and postmigration experiences (e.g., authorized vs unauthorized migration, family vs individual migration or family reunification, labor migration, arrival conditions, acculturation and assimilation stresses.) Potentially protective psychosocial factors include a risk-reducing familial context, including negative attitudes toward substance use, abstention from substance use by siblings and parents, and family involvement and cohesion. Delayed initiation into substance use (i.e., after adolescence) is itself associated with reduced risk of engaging in substance use over the lifecourse.[6] Thus, the mere presence or absence of 1 or more risk factors does not imply future substance use. For this reason, interactions between risk and protective factors must be examined systematically.

We examined the substance use attitudes and behaviors of immigrant and native-born populations to assess the relation between race/ethnicity and nativity and substance use. We analyzed various psychosocial factors relevant to immigrant communities' experiences with illicit substance use to answer the following research questions: (1) Do perceptions regarding the health and social impacts of illicit substance use vary according to race/ethnicity and nativity? (2) Are race/ethnicity, nativity, and level of perceived risk to health posed by substance use independently associated with illicit substance use? (3) Are other immigration-related measures (e.g., age at immigration, language preferences) independently associated with immigrants' level of illicit substance use? We hypothesized that persons who migrated to the US as adolescents would be more likely to engage in substance use than would postadolescent immigrants and that individuals indicating a Spanish-language preference (vs English) for survey participation would be less likely to engage in substance use.

METHODS

Data

Data were obtained from the 2002 NSDUH. The NSDUH is sponsored by the Substance Abuse and Mental Health Services Administration's Office of Applied Statistics and assesses national and state prevalences and correlates of drug, alcohol, and tobacco use; sociodemographic, mental health, and other data are also collected.[19] Eligible respondents are noninstitutionalized, 12 years and older, and reside in the United States (including civilians residing on military bases).

The 2002 sample included an independent multistage area probability sample for each state and the District of Columbia. State identifiers were not included in NSDUH public-use files. The survey was administered in person with computer-assisted personal interviewing and computer-assisted audio interviewing, both of which increase respondents' sense of confidentiality during report of sensitive behaviors.[19]

Independent Variables

The NSDUH public-use file included 54 079 records, of which 36 370 were adults 18 years and older, representing 210.4 million US adults. Analyses were limited to Latinos and non-Latino Whites 18 years and older (unweighted N=29 926; weighted N=173.7 million adults). Key independent variables were nativity and self-reported race/ethnicity. We compared adult Latinos' and non-Latino Whites' substance use attitudes and behaviors. The distribution by racial/ethnic group and nativity of all adults 18 years and older was 68.2% US-born non-Latino White (unweighted n=24 671; hereafter, US-born White), 5% US-born Latino (unweighted n=2177), 3% immigrant non-Latino White (unweighted n=848), 6.8% immigrant Latino (unweighted n=2149), and 17% from all other racial/ethnic groups (unweighted n=6413). Latino subgroup data and citizenship status were not provided and were unavailable for analyses. All analyses were weighted with population weights provided by the NSDUH.

We examined respondent's perceived risk to health of substance use for 1 licit and 4 illicit substances, measured by these questions: "How much do people risk harming themselves physically and in other ways when they . . . " (1) "smoke 1 or more packs of cigarettes per day?" (2) "try LSD once or twice?" (3) "try heroin once or twice?" (4) "smoke marijuana once a month?" and (5) "use cocaine once a month?" Response options were: "no risk," "slight risk," "moderate risk," and "great risk." We dichotomized responses into 2 categories (no and slight risk and moderate and great risk).

Immigrants' experiences may be shaped by pre- and postmigration contexts.[18] We examined participants' self-reported age at immigration (in years) as one measure of the migration context and, as the other, respondents' preferred language for survey participation (English vs Spanish), which is a valid proxy indicator for postmigration acculturation and integration into the receiving community.[20]

Other sociodemographic, health status, and contextual covariates included in multivariate analyses were age, gender, health status, marital status, family income, educational attainment, self-rated health, mental health status, and population of metropolitan statistical area (MSA; a federally specified geographic area composed of a defined population center and its integrated adjacent communities[21]) of residence.

Dependent Variables

We examined 2 outcomes: (1) report of moderate or great perceived risk of substance use and (2) self-reported lifetime substance use. Sample sizes for 12-month use for 4 of the 5 substances (i.e., cigarettes, marijuana, LSD, heroin, cocaine) were insufficient to answer our research questions. Therefore, we examined lifetime substance use by aggregating responses describing recency of substance use into a dichotomous variable: any lifetime use (i.e., within the past 30 days, within the past 12 months, more than 12 months ago but within the past 3 years, more than 3 years ago) versus never used the substance.

Statistical Analyses

We analyzed data using SUDAAN 9.0.1 (Research Triangle Institute, Research Triangle Park, NC), a statistical package that accounts for complex survey sampling methodology. Cross-tabulations were developed to calculate the prevalence of perceived risk and self-reported substance use by race/ethnicity and nativity. Multivariate logistic regression models were developed to assess relations between race/ethnicity, nativity, and risk perceptions, immigration measures, and substance use. We calculated adjusted odds ratios (ORs) and 95% confidence intervals (CIs).

First, we used 5 logistic regression models to examine the relations between use of cigarettes, marijuana, LSD, cocaine, and heroin and race/ethnicity by nativity, perceived risk, survey language, and population of MSA of residence, with adjustment for other sociodemographic, health status, and economic covariates (gender, age, educational attainment, family income, and marital, health, mental health, and work status). Second, another set of 5 models examined the migration context, operationalized by age at immigration, with simultaneous adjustment for all covariates included in the first set of models. Results were based on weighted data.

RESULTS

Study population characteristics are shown in Table 1. Regardless of nativity, Latinos were younger than were Whites (52.8% of US-born Latinos and 43.4% of immigrant Latinos were ages 18–34 years). The population was nearly evenly divided according to gender. The majority (95.6%) of US-born Latinos responded to the survey in English, versus 37.6% of immigrant Latinos. More than half of native and immigrant non-Latino Whites and Latino immigrants, and slightly less than half of US-born Latinos, were married. Latinos and immigrant non-Latino Whites mostly resided in large metropolitan areas.

Perceived Health and Social Risks of Substance Use

Table 2 reports the prevalence of moderate or great perceived risk of various substances for Latinos and Whites, by nativity. Latino immigrants were significantly more likely than were US-born Whites to perceive significant risks from marijuana use (85.6% vs 63.4%) and LSD (94.2% vs 88.9%). US-born Latinos' report of perceived risks differed from that of US-born Whites for LSD (91.9% vs 88.9%) and heroin (97% vs 95.4%). Immigrant non-Latino Whites' attitudes were similar to those of US-born Whites; both groups were less likely than were immigrant Latinos to view marijuana and LSD use as risky behaviors.

Latinos' views regarding the risk of marijuana use between US- and foreign-born Latinos (67.3% vs 85.6%), a difference similar to that between immigrant Latinos and US-born Whites. Latino immigrants were more likely than were US-born Latinos to view LSD use as harmful (94.2% vs 91.9%, respectively), but less likely than were US-born Latinos to view heroin use as harmful (97% vs 95.2%).

Lifetime Substance Use

We examined lifetime prevalence of cigarette, marijuana, LSD, cocaine, and heroin use

TABLE 1—Selected Characteristics of US Latinos and Whites 18 Years and Older, by Nativity: National Survey on Drug Use and Health, 2002

	US-Born White, %	US-Born Latino, %	Immigrant non-Latino White, %	Immigrant Latino, %
Age, y				
18–25	13.1	28.2	8.8	17.2
26–34	14.4	24.6	18.4	26.2
35–49	30.9	27.3	29.2	33.4
≥50	41.6	19.9	43.6	23.3
Gender				
Men	48.2	47.1	45.2	53.9
Women	51.8	52.9	54.8	46.2
Survey language				
English	100	95.6	100	36.7
Spanish	0	4.4	0	63.3
Marital status				
Married	59.7	45.6	65.1	62.2
Single	40.3	54.4	34.9	37.8
Population of metropolitan statistical area of residence				
≥1million	37.4	53.3	65.3	69.2
<1 million	62.7	46.7	34.7	30.8

Note. Percentages were weighted to the US population. Unweighted sample sizes were as follows: US-born White: 24 742; US-born Latino: 2187; immigrant non-Latino White: 848; immigrant Latino: 2149.

TABLE 2—Perception of Moderate or Great Risk of Using Illicit Substances and Lifetime Substance Use Reported by US Latinos and Whites 18 Years and Older, by Nativity: National Survey on Drug Use and Health, 2002

Substance Use Behavior	US-Born White, %	US-Born Latino, %	Immigrant non-Latino White, %	Immigrant Latino, %
Smoking ≥1 pack of cigarettes/day	94.4	94.7	93.7	93.2
Trying LSD once or twice[a]	88.9	91.9[b,c]	87.9[c]	94.2[b]
Trying heroin once or twice[a]	95.4	97.0[b,c]	95.2	95.2
Smoking marijuana once per month	63.4	67.3[c]	63.5[c]	85.6[b]
Using cocaine once or twice per month	91.1	91.8	92.0	92.2
Lifetime substance use				
Cigarettes	78.4	72.4[b,c]	70.4[b,c]	52.9[b]
Marijuana	46.5	51.5[b,c]	31.6[b,c]	17.0[b]
Cocaine	17.5	20.1[c]	10.0[c]	8.7[b]
Heroin	1.7	2.5[c]	1.5	. . .
LSD	13.9	13.2[c]	8.9[b,c]	1.2[b]

Note. Percentages were weighted to the US population. Unweighted sample sizes were as follows: US-born White: 24 742; US-born Latino: 2187; immigrant non-Latino White: 848; immigrant Latino: 2149. Ellipses indicate data not available because unweighted sample size was fewer than 15 reported cases.
[a]No time frame specified.
[b]Significantly different from US-born Whites; $P < .05$.
[c]Significantly different from immigrant Latinos; $P < .05$.

(Table 2), disaggregating data by race/ethnicity and nativity. Lifetime consumption of LSD, cocaine, and heroin among US-born Latinos was not statistically different from those of US-born Whites. However, US-born Latinos reported less lifetime use of cigarettes (72.4% vs 78.4%) and more lifetime use of marijuana (51.5% vs 46.5%) than did US-born Whites. Immigrant Latinos were significantly less likely than were US-born Whites to use any substances. US-born Whites were 3 times more likely than were immigrant Latinos to use marijuana (46.5% vs 17%) and twice as likely to use cocaine (17.5% vs 8.7%). Immigrant non-Latino Whites were significantly less likely than were US-born Whites to use cigarettes, marijuana, LSD, or cocaine (Table 2).

Latinos' unadjusted lifetime prevalence of substance use differed by nativity. Immigrant Latinos' rates of lifetime use of all substances of interest were lower than those of US-born Latinos (Table 2). Immigrant Latinos' marijuana use prevalence was one third that of US-born Latinos' (17% vs 51.5%). Differences in lifetime LSD use were especially pronounced (1.2% and 13.2%, respectively). Latino immigrants reported lower use of cigarettes, marijuana, and LSD than did immigrant Whites.

Race/Ethnicity, Nativity, and Substance Use

We tested observed differences in substance use according to race/ethnicity and nativity by constructing logistic regression models. Covariates included demographic, economic, health status, and MSA size (Table 3) and age at immigration (Table 4). After adjustment for other covariates, the model showed that Latino immigrants were significantly less likely than were US-born Whites to engage in any lifetime substance use. Latino immigrants' odds of using cigarettes, marijuana, and cocaine were approximately one third of those of US-born Whites and were even lower for LSD (OR=0.1; Table 3); results were not significantly changed after the model adjusted for age at immigration (Table 4). Similarly, immigrant non-Latino Whites were significantly less likely than were US-born Whites to use cigarettes (OR=0.70), marijuana, cocaine, (OR<0.50 for each) and LSD (OR<0.60; Tables 3 and 4). As with Latinos, control for age at immigration did not appreciably change parameter estimates aside from producing a slight decline in the ORs for marijuana and cocaine use (Table 4). By contrast, US-born Latinos were less likely than were US-born Whites to use cigarettes and LSD (OR<0.75 for each).

Perceiving moderate or great risk was significantly associated with lower rates of lifetime use of marijuana, cocaine, LSD, and heroin (OR≤0.25 for each; Tables 3 and 4); coefficients were unchanged after we controlled for age at immigration (Table 4).

Immigration-Related Measures

We examined immigration-related measures, including language preference, geographic dispersal as represented by MSA size, and age at immigration. Latinos who preferred a Spanish-language survey had lower odds of lifetime use of cigarettes (OR=0.73), marijuana (OR=0.44), and LSD (OR=0.21) than did Latinos who completed an English-language survey (Table 3); after we controlled for age at immigration, we found that estimates were not significantly changed for marijuana (OR=0.49) and LSD (OR=0.26) use and were nonsignificant for cigarette use (Table 4). These results supported the hypothesis that adults with a Spanish-language preference would be less likely to engage in less substance abuse than would adults with an English-language preference. Residents of large

TABLE 3—Predictors From Logistic Regression Analysis (Partial Model) of Lifetime Use of Licit and Illicit Substances Among US Latinos and Whites 18 Years and Older: National Survey on Drug Use and Health, 2002

	Cigarettes, OR (95% CI)	Marijuana, OR (95% CI)	Cocaine, OR (95% CI)	LSD, OR (95% CI)	Heroin, OR (95% CI)
Nativity and ethnicity					
US-born White (Ref)	1.00	1.00	1.00	1.00	1.00
US-born Latino	0.73[a,b] (0.60, 0.88)	1.05[b] (0.87, 1.27)	0.99y (0.80, 1.22)	0.74[a,b] (0.60, 0.90)	1.39[b] (0.81, 2.40)
Immigrant non-Latino White	0.70[a,b] (0.54, 0.90)	0.46[a] (0.37, 0.57)	0.48[a] (0.35, 0.66)	0.59[a,b] (0.42, 0.83)	0.98 (0.41, 2.30)
Immigrant Latino	0.37[a] (0.29, 0.46)	0.33[a] (0.24, 0.44)	0.33[a] (0.23, 0.46)	0.10[a] (0.06, 0.18)	0.40 (0.14, 1.14)
Perceived risk					
None/slight (Ref)	1.00	1.00	1.00	1.00	1.00
Moderate/great	0.91 (0.75, 1.11)	0.25* (0.22, 0.27)	0.17* (0.15, 0.19)	0.18* (0.16, 0.20)	0.15* (0.10, 0.21)
Survey language					
English (Ref)	1.00	1.00	1.00	1.00	1.00
Spanish	0.73* (0.56, 0.96)	0.44* (0.30, 0.63)	1.04 (0.67, 1.59)	0.21* (0.06, 0.72)	0.31 (0.06, 1.79)
Population of metropolitan statistical area of residence					
≥1 million	0.97 (0.88, 1.07)	1.25* (1.14, 1.37)	1.35* (1.21, 1.50)	1.23* (1.10, 1.39)	1.17 (0.87, 1.58)
<1 million (Ref)	1.00	1.00	1.00	1.00	1.00

Note. OR = odds ratio; CI = confidence interval. Percentages were weighted to the US population. Unweighted sample sizes were as follows: US-born White: 24 742; US-born Latino: 2187; immigrant non-Latino White: 848; immigrant Latino: 2149. Models also included health status, gender, age, mental health status, education, marital status, family income, and work status.
[a]Significantly different from US-born Whites; $P < .05$.
[b]Significantly different from immigrant Latinos; $P < .05$.
*$P < .05$ (vs reference group).

TABLE 4—Predictors From Logistic Regression Analysis (Full Model) of Lifetime Use of Licit and Illicit Substances Among US Latinos and Whites 18 Years and Older: National Survey on Drug Use and Health, 2002

	Cigarettes, OR (95% CI)	Marijuana, OR (95% CI)	Cocaine, OR (95% CI)	LSD, OR (95% CI)	Heroin, OR (95% CI)
Nativity and ethnicity					
US-born White (Ref)	1.00	1.00	1.00	1.00	1.00
US-born Latino	0.73[a,b] (0.60, 0.88)	1.05[b] (0.86, 1.27)	0.99[b] (0.80, 1.22)	0.74[a,b] (0.60, 0.90)	1.39 (0.81, 2.40)
Immigrant non-Latino White	0.67[a,b] (0.49, 0.91)	0.35[a,b] (0.25, 0.49)	0.39[a] (0.24, 0.64)	0.42[a,b] (0.23, 0.80)	1.09 (0.30, 3.92)
Immigrant Latino	0.35[a] (0.26, 0.48)	0.24[a] (0.16, 0.35)	0.26[a] (0.15, 0.44)	0.07[a] (0.03, 0.15)	0.43 (0.12, 1.53)
Perceived risk					
None/slight (Ref)	1.00	1.00	1.00	1.00	1.00
Moderate/great	0.91 (0.75, 1.11)	0.25* (0.22, 0.27)	0.17* (0.15, 0.19)	0.18* (0.16, 0.20)	0.14* (0.10, 0.21)
Survey language					
English (Ref)	1.00	1.00	1.00	1.00	1.00
Spanish	0.77 (0.58, 1.02)	0.49* (0.34, 0.71)	1.06 (0.69, 1.64)	0.26* (0.08, 0.90)	0.36 (0.07, 1.92)
Age at immigration, y					
≤5	1.35 (0.90, 2.04)	2.30* (1.45, 3.67)	1.65 (0.87, 3.13)	2.82* (1.24, 6.42)	1.94 (0.39, 9.78)
6–10	1.26 (0.77, 2.05)	1.54 (0.91, 2.60)	1.11 (0.52, 2.37)	1.76 (0.66, 4.71)	0.30 (0.05, 1.65)
11–15	1.03 (0.69, 1.55)	1.70* (1.01, 2.86)	1.24 (0.64, 2.40)	2.22 (0.89, 5.56)	1.05 (0.13, 8.59)
16–20	0.90 (0.62, 1.32)	1.04 (0.66, 1.64)	1.40 (0.76, 2.57)	0.75 (0.29, 1.96)	0.49 (0.06, 4.33)
21–25	0.94 (0.63, 1.40)	1.40 (0.82, 2.39)	1.44 (0.75, 2.73)	0.94 (0.37, 2.40)	0.64 (0.10, 4.27)
≥26 (Ref)	1.00	1.00	1.00	1.00	1.00
Population of metropolitan statistical area of residence					
≥1 million	0.97 (0.88, 1.07)	1.25* (1.14, 1.37)	1.35* (1.21, 1.50)	1.24* (1.10, 1.39)	1.17 (0.87, 1.58)
<1 million (Ref)	1.00	1.00	1.00	1.00	1.00

Note. Percentages were weighted to the US population. Unweighted sample sizes were as follows: US-born White: 24 742; US-born Latino: 2187; immigrant non-Latino White: 848; immigrant Latino: 2149. Models also included health status, gender, age, mental health status, education, marital status, family income, and work status.
[a]Significantly different from US-born Whites; $P < .05$.
[b]Significantly different from immigrant Latinos; $P < .05$.
*$P < .05$ (vs reference group).

metropolitan areas were more likely than were residents of small metropolitan areas to report using marijuana, cocaine, and LSD (Tables 3 and 4).

The association between age at immigration and substance use was inconsistent (Table 4), and our results did not support the hypothesis that persons immigrating at a younger age would be more likely than those immigrating at an older age to engage in substance use. Supporting ORs were mostly nonsignificant across the substances examined, with the exception of marijuana and LSD use. Odds of lifetime marijuana use were higher among immigrants 15 years or younger at immigration (OR=2.30 for children aged ≤5 years; OR=1.70 for children aged 11–15 years; the OR for children migrating at age 6–10 years was nonsignificant). Odds of using LSD were significantly elevated for persons who immigrated at 5 years or younger (OR=2.82), compared with persons who immigrated at 26 years or older.

Variation exists within Latino and immigrant communities. We examined whether immigrant Latinos differed from US-born Latinos and immigrant non-Latino Whites. US-born Latinos were significantly more likely than were immigrant Latinos to have ever used any substance of interest (Table 3); differences in lifetime heroin use disappeared after we controlled for age at immigration (Table 4). After we controlled for age at immigration, we found that Latino immigrants were significantly less likely than were non-Latino White immigrants to use cigarettes, marijuana, or LSD (Table 4).

DISCUSSION

After examining the relation between adults' lifetime substance use and race/ethnicity by nativity, age at immigration, and perceived risk, we found that Latino and non-Latino White immigrants had lower odds of cigarette, marijuana, cocaine, and LSD use than did US-born Whites. Latino immigrants were less likely than were non-Latino White immigrants to use cigarettes, marijuana, and LSD. Risk perceptions were independently associated with reduced lifetime use of marijuana, cocaine, LSD, and heroin. We found that Spanish speakers were less likely than were English speakers to smoke marijuana or to use LSD after we controlled for age at immigration. Age at immigration was an inconsistent correlate of substance use; younger age at immigration (≥5 years) was associated with use of marijuana and LSD but not other substances (data for Latino immigrants only available as a supplement to the online version of this article at http://www.apha.org).

Our findings complement results from other immigrant-focused studies in finding that foreign nativity was protective and associated with lower substance use.[3,22–26] In our study, this finding persisted after we controlled for differences in attitudes toward substance use. Additionally, our findings lend

support for disaggregating substance use data by nativity and race/ethnicity; these indicators may explain behavioral subgroup variation, aid in identifying at-risk groups, and inform prevention and intervention planning.

Our study provides a unique contribution to the overall literature in 3 key areas: (1) sample size, (2) outcomes analyzed, and (3) use of multiple immigration-related indicators. We extend previous research by reporting on a nationally representative sample of all adults and their nativity and immigration characteristics rather than on a subset (e.g., young adults).[27,28] Few studies have analyzed types of substance use among adults or a nationally representative adult sample while taking into account multiple measures of acculturation.[3,29–32] The public health significance of immigrant adults' substance use is substantial. Roughly 70% of immigrants are aged 18 to 54 years,[33] a period that is characterized by high fertility: 60.9% of immigrant families have at least 1 dependent child,[33] the majority of whom are US born.[34] As a result, a sizeable proportion of US-born children are members of immigrant families; they have a higher risk of exposure to substance use compared with their immigrant parents and peers in their countries of nativity. For these reasons, it is important to understand the attitudes and behaviors of immigrant adults related to substance use, because they significantly influence children's and families' substance use views and behaviors.[6]

We reported on both attitudes toward and lifetime use of cigarettes, marijuana, cocaine, heroin, and LSD rather than reporting an aggregated measure of substance use. By disaggregating racial/ethnic and immigrant subgroup differences regarding these specific substances, it is possible to identify at-risk populations and emerging drugs and to develop targeted interventions. Although a previous study reported on White and Hispanic immigrants' substance use in aggregate,[3] our results revealed similarities and differences between immigrant subgroups. Our findings highlight the health-promoting behaviors of Latino immigrants across various substances.

Building on previous immigrant-focused substance use research,[25–27,29,31,32] we used the best available data and concurrently implemented 3 measures of acculturation—nativity, language preference, and age at immigration—rather than relying on 1 indicator. Substance use varied depending on the measure studied and revealed at-risk populations not evident from analyses of a single measure. Populations of public health concern include young immigrants consuming marijuana, children in second and later generations, Spanish speakers, and immigrant families.

Limitations

We were limited in examining subgroup or regional patterns in substance use attitudes and behaviors because of lack of data on Latino subgroups, birth country, and states of residence. Risk taking and sensation seeking was not measured, although it has been suggested that immigrants differ on this measure[35] and that examining it in greater detail would be important. Because the NSDUH is cross-sectional, we could not examine temporal associations that would elucidate behavioral, attitudinal, and social changes among aging immigrants and their communities. Premigration access to and use of specific substances were not measured by the survey. Several populations were unrepresented in our analyses (e.g., homeless or incarcerated persons, residents of long-term care or psychiatric facilities), which limits their generalizability and likely produces an underestimate of lifetime substance use. Despite efforts to reduce response biases in NSDUH,[19,36] retrospective questions may result in underreporting of substance use or recall bias. Despite these limitations, the NSDUH is widely used and provides important opportunities to examine racial/ethnic subgroup substance use behaviors and risk factors.

Implications

Immigrants have become a sizeable population in the United States,[33] and Latinos are the largest racial/ethnic subgroup in the United States.[37] Findings from our study underscore the importance of examining population subgroup differences, including the need to disaggregate by racial/ethnic subgroup, nativity, and immigration measures. These characteristics can inform culturally competent tailored services for at-risk and substance-using populations. For example, differences in substance use observed among less-acculturated Spanish-speaking adults suggests they are retaining other unmeasured or unobservable behaviors or norms from their native countries that protect against substance use, including antidrug-use norms, strong social networks, and familial or cultural ties.[3,38] Programs that strengthen familial involvement and address emerging problems, including risk factors for substance use throughout adolescence, may increase immigrant families' resiliency and improve health outcomes in the new climate of the United States. Examples of prevention programs that address familial conflict and postmigration stressors related to acculturation processes include Family Effectiveness Training and *Familias Unidas* (United Families).[39]

Previous findings on the relation between immigrants' age at immigration and substance use are mixed.[23,25,26] We found that age at immigration was an inconsistent correlate of substance use. Protective familial and cultural effects may be attenuated by greater exposure to American cultural norms as time in the United States increases.[40] Low rates of cocaine and heroin use suggests that protective factors associated with these substances are retained regardless of age at immigration. Researchers examining immigration effects on substance use should consider expanding, beyond those reported here, the number and type of immigration-based indicators they analyze. Factors that may shed light on multidimensionality of acculturation might include measures of family support, involvement, and attitudes toward illicit substances held by siblings and parents, language proficiency, composition and nature of social networks, stress coping mechanisms, risk-taking behaviors, and nature of contact with the country of origin. Differentiating between pre- and postmigration conditions will improve our understanding of synergy among these factors. ■

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Contributors

V.D. Ojeda originated the study, analyzed and interpreted data, and prepared the article. T.L. Patterson and S.A. Strathdee interpreted data and revised the article.

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Human Participant Protection

Protocol approval was not obtained because data were publicly available and could not be traced to survey participants. Therefore, the study did not qualify as "human subjects" research.

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